Small Business Innovation Research/Small Business Tech Transfer

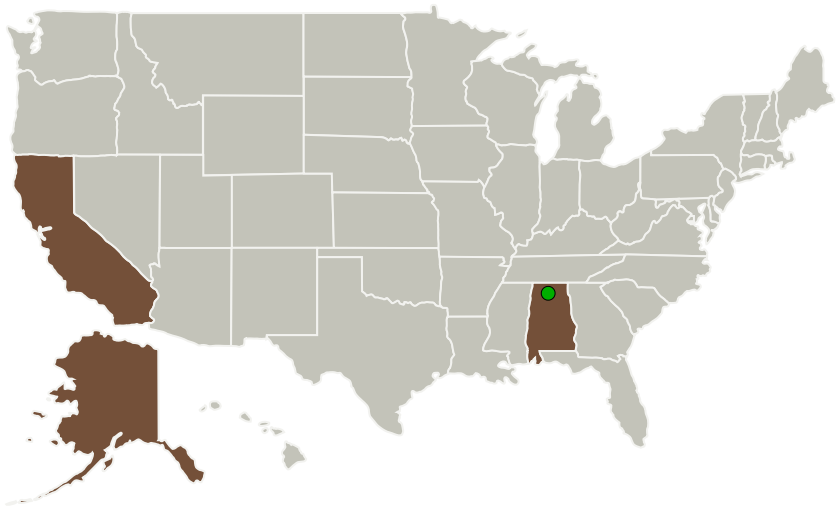
NLV Upper Stage Development and Flight Testing, Phase I

Completed Technology Project (2015 - 2016)

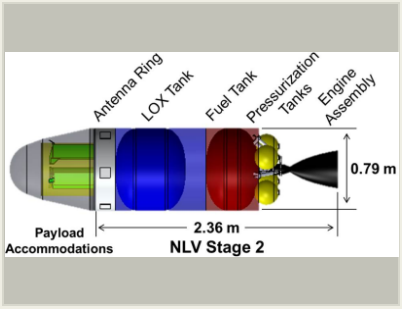
Project Introduction

The technical innovation proposed here is the design during Phase I of a high performance upper stage for a two-stage "20 / 450" Nanosat Launch Vehicle (NLV) that is configured to deliver up to 20 kg to a 450 km low Earth orbit (Figure 1). Parallel tasks prepare for the Phase II development and sub-orbital flight testing of a prototype vehicle that is directly traceable to the orbital-capable NLV. Furthermore, by teaming with the University of Alaska Fairbanks and Alaska Space Corporation to pathfind the concept of operations at the latter's Kodiak Space Launch complex, we are taking a key step towards establishing dedicated launch access to polar orbits for the cubesat and nanosat communities.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Garvey Spacecraft Corporation	Lead Organization	Industry	Long Beach, California
Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama
University of Alaska Fairbanks(UAF)	Supporting Organization	Academia	Fairbanks, Alaska



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Primary U.S. Work Locations	
Alabama	Alaska
California	

Project Transitions

June 2015: Project Start

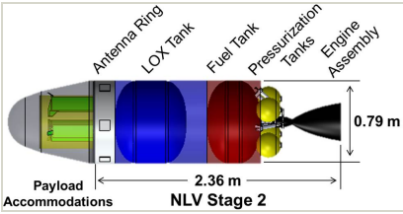
June 2016: Closed out

Closeout Summary: NLV Upper Stage Development and Flight Testing, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/139168)*

Images



Briefing Chart Image
NLV Upper Stage Development and Flight Testing, Phase I *(https://techport.nasa.gov/image/136296)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Garvey Spacecraft Corporation

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Christopher M Bostwick

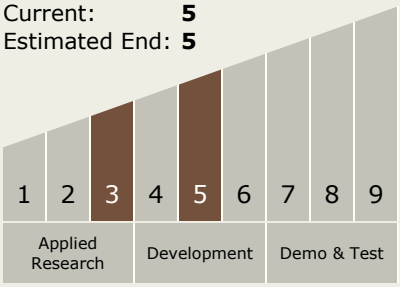
Co-Investigator:
Christopher Bostwick

NLV Upper Stage Development and Flight Testing, Phase I

Completed Technology Project (2015 - 2016)

Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.1 Chemical Space Propulsion
    - TX01.1.1 Integrated Systems and Ancillary Technologies

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System